"Robustness of spatialpreferentialattachment networks"

A growing family of random graphs is called robust if it retains a giant component after percolation with arbitrarily small positive retention probability. We study robustness for graphs, in which new vertices are given a spatial position on the unit circle and are connected to existing vertices with a probability favouring short spatial distances and high degrees. In this model of a scale-free network with clustering we can independently tune the power law exponent τ of the degree distribution and the exponent δ at which the connection probability decreases with the distance of two vertices. We show that the network is robust if $\tau < 2 + 1/\delta$, but fails to be robust if $\tau > 2 + 1/(\delta - 1)$. This is the first instance of a scale-free network where robustness depends not only on its degree distribution but also on its clustering features. This is joint work with Emmanuel Jacob (ENS Lyon).